

## **REMARKS**

The Official Action dated March 28, 2008 has been carefully considered. Reconsideration is respectfully requested in view of the following remarks in support of allowance.

In the Official Action, claims 1, 4-6, 10, 14-16, 20 and 24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Sussman et al. (US 5,686,960) in view of Miyamoto (US-PGPUB 2002/0175986).

However, as will be set forth in detail below, it is submitted that the methods and systems defined by claims 1-24 of the subject application are nonobvious over and patentably distinguishable from Sussman et al. in view of Miyamoto. Furthermore, Miyamoto is non-analogous art and, as such, cannot serve as the basis for a rejection. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

References relied upon to support a rejection under 35 U.S.C. §103 must provide an enabling disclosure, i.e., they must place the claimed invention in the possession of the public. *In re Payne*, 203 U.S.P.Q. 245 (CCPA 1979). Further, to establish prima facie obviousness of the claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974).

The Examiner has asserted that Sussman et al. teaches the limitation of “creating a second output based on the control parameter and the first output” found in claims 1, 10, 20 and 24. In supporting this assertion, the Examiner has specifically referred to column 15, lines 64-67 of Sussman et al. Applicants respectfully disagree with this characterization of Sussman et al.

Sussman et al. specifically recites:

[d]igital control signals received from SIN and COS lookup tables in a control unit such as a personal computer 76 (FIG. 7) are provided to first and second control terminals 506 and 508, so that the analog outputs of the first and second channels 498 and 500 can be generated. The output signals of the first and second channels 498 and 500 are provided to buffers 510 and 512, respectively.

Sussman et al., column 15, line 61 - column 16, line 1. Based on this recitation, Sussman et al. does not teach creating a second output *based* on the control parameter and the first output. Instead, the first output signal and the second output signal in the method of Sussman et al. are separate and distinct. As such, Sussman et al. does not teach or suggest every limitation of claims 1, 10, 20 and 24. Further, Miyamoto et al. does not assist Sussman et al. in teaching or suggesting this limitation. Accordingly, claims 1, 10, 20 and 24 are non-obvious and patentably distinguishable over the combination of Sussman et al. in view of Miyamoto. Reconsideration is respectfully requested.

Further, making specific reference to column 16, lines 1-3 of Sussman et al., the Examiner has asserted that Sussman et al. teaches the limitation found in claims 1, 10, 20 and 24 of “using the second output to process the one of the plurality of tiles.” Applicants respectfully disagree with this characterization of Sussman et al.

Column 16, lines 1-3 of Sussman et al. specifically states “[i]f desired, a single channel digital-to-analog converter configured for differential output can be used instead of a dual channel digital-to-analog converter.” Applicants respectfully submit that this passage from Sussman et al. does not teach or suggest the limitations of using a second output to process the one of a plurality of tiles. Indeed, column 16, lines 1-3 of Sussman et al. does not contain any reference to a second output or a plurality of image tiles. Miyamoto does not assist Sussman et al. in supplying these teachings. Accordingly, the Examiner has not established a prima facie case of obviousness with respect to claims 1, 10, 20 and 24. Therefore, Applicants respectfully

submit that claims 1, 10, 20 and 24 are non-obvious over and patentably distinguishable from the combination of Sussman et al. in view of Miyamoto. Reconsideration is respectfully requested.

In rejecting claims 1, 10, 20 and 24, the Examiner conceded that Sussman et al. fail to teach or suggest determining the concentration ratio for one of a plurality of tiles. The Examiner asserted that Miyamoto teaches an image forming process and image forming apparatus where a concentration ratio of liquid image forming solutions is determined. As a rationale for combining Miyamoto with Sussman et al. the Examiner has asserted that, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the histogram equalization method of processing images, system, and computer program of Sussman et al. with the concentration ratio of liquid image forming solutions used in a printing method and apparatus of Miyamoto to implement the subject invention.

Independent claims 1, 10, 20, and 24 of the subject application recite the limitation of "determining a concentration ratio for one of a plurality of tiles." The concentration ratio (CR) determines the smoothness of an image or portion of an image and is defined in terms of the population (P) (e.g., a number of pixels) of each level (L) of a histogram such that:

$$CR = \frac{\left(\sum_L P_L\right)^2}{\left(\sum_L P_L^2\right)}$$

Miyamoto does not contain any reference or teaching directed to image processing or the use of a concentration ratio for image processing. Instead, Miyamoto teaches an image forming process (e.g., a method of physically printing an image on a medium) and a related apparatus. More specifically paragraph [0030], lines 8-10 of Miyamoto, referenced by the Examiner, recites that "it is preferred that a ratio of a concentration (percent by mass) of the liquid of 'high

concentration' to the liquid of 'low concentration' is from 1.2:1 to 10:1." The terms "high concentration" and "low concentration," as used in Miyamoto, refer to the chemical concentration (percent by mass) *of liquid image forming solutions* which are deposited (e.g., printed) on a medium to form an image. Miyamoto, paragraph [0029], lines 1-8.

Applicant respectfully submits that the concentration ratio taught in the subject application is patentably distinguishable from the chemical concentration ratio of liquid image forming solutions as disclosed in Miyamoto. Specifically, the concentration ratio of a liquid image forming solution of high concentration to an image forming solution of low concentration does not enable determining a concentration ratio for one of a plurality of tiles for use in a histogram equalization method or system for processing images as set out in the claims of the subject application. As such, Miyamoto fails to disclose the limitation of determining a concentration ratio for one of a plurality of tiles as taught and disclosed in the subject application. Therefore, the combination of Sussman et al. with Miyamoto does not provide an enabling disclosure and does not place the claimed invention in the possession of the public whereby the rejection under 35 USC § 103 is traversed. Reconsideration is respectfully requested.

Moreover, according to the MPEP, the rationale to support a conclusion that the claim would have been obvious to one skilled in the art is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination yielded nothing more than predictable results to one of ordinary skill in the art. If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art. See MPEP 2143 (A) (emphasis added). Applicants respectfully submit that the functionality of the concentration ratio (CR) of the present invention

is patentably distinct from the functionality of the concentration ratio of liquid image forming solutions of Miyamoto.

As discussed hereinabove, the concentration ratio of Miyamoto is defined as a ratio of liquid image forming solution of a high concentration to a liquid image forming solution of low concentration. The concentration ratio is used as a guideline in the process of selecting the appropriate concentrations of various image forming solutions for use in a printing process. Miyamoto, paragraph 33. In contrast, the concentration ratio (CR) of the subject invention is defined as a ratio of pixels in each level of a histogram of a particular image as described mathematically hereinabove. The concentration ratio (CR) of the subject application may be used as an objective indication of the smoothness of an image and, as such, may also be used to determine the amount of equalization or image enhancement needed to improve the quality of the image. Accordingly, the concentration ratio CR of claims 1, 10, 20 and 24 has a different function than the concentration ratio of liquid image forming solutions of Miyamoto. Therefore, in order for the combination of Sussman et al. and Miyamoto to read on the limitations of claims 1, 10, 20 and 24 of the subject invention, it would be necessary to change the function of the concentration of liquid image forming solution of Miyamoto. As such, the Examiner has not provided a permissible rationale in support of the finding that claims 1, 10, 20 and 24 are obvious over Sussman et al. in view of Miyamoto. Reconsideration is respectfully requested.

Moreover, the Miyamoto reference is non-analogous art which cannot form a basis for rejecting the subject application. In order for an Examiner to rely on a reference in rejecting an applicant's invention, "the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992); see also *In re*

*Deminiski*, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986); and *State Contracting & Eng'g Corp. v. Condotte America, Inc.*, 346 F.3d 1057, 1069, 68 USPQ2d 1481, 1490 (Fed. Cir. 2003) ("where the general scope of a reference is outside the pertinent filed of endeavor, the reference may be considered analogous art if subject matter disclosed therein is relevant to the particular problem with which the inventor is involved.").

The subject application discloses a method and image processing system for reducing artifacts in images caused by image processing. The method of processing the image is carried out electronically utilizing a concentration ratio of pixels to process the image and thereby improve the quality of the image when the image is electronically captured and displayed. In contrast, Miyamoto is related to a method and apparatus for printing an image on a medium using image forming solutions having different concentration ratios. The concentration ratios of image forming solutions are not used to process the image but are, instead, used to print the image on a substrate. Indeed, Miyamoto does not contain any teaching or reference to *image processing* or *reducing artifacts in images that occur as a result of image processing*. As such, Miyamoto is not relevant to the particular problem which the subject application seeks to solve, specifically improving the image quality of an electronic image. Accordingly, Miyamoto is non-analogous art that cannot be used as a basis for rejecting the subject application. Reconsideration of the rejections based on Miyamoto is respectfully requested.

Based on the foregoing remarks, Applicant respectfully submits that claims 1, 10, 20, and 24 are non-obvious over Sussman et al. in view of Miyamoto and requests reconsideration of the rejections.

Further, Applicant also submits that claims 2-9 that depend from independent claim 1, claims 11-19 that depend from independent claim 10, and claims 21 and 22 that depend from

independent claim 20, are in proper condition for allowance. Reconsideration is respectfully requested.

In the Official Action, claims 3 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sussman et al. and Miyamoto, as applied to claims 1 and 10, and further in view of Sawada et al. (US 7,023,582). The Examiner conceded that Sussman et al. and Miyamoto fail to teach creating a first output including creating a first lookup table, and creating the second output including creating a second lookup table as recited in claims 3 and 13. The Examiner asserted that Sawada et al. teach an image processing apparatus, where the first output is created including creating a first lookup table and a second output is created including creating a second lookup table.

However, as will be set forth in detail below, it is submitted that the methods and system as defined by claims 3 and 13 are nonobvious over and patentably distinguishable from Sussman et al. and Miyamoto further in view of Sawada et al. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

As noted hereinabove, with respect to independent claims 1 and 10, from which claims 3 and 13 depend, the combination of Sussman et al. with Miyamoto does not teach or suggest each limitation of the claimed subject matter and, as such, the combination of Sussman et al. with Miyamoto does not place the claimed subject matter in possession of the public. Moreover, Miyamoto is non-analogous art that may not form a basis for rejecting the claimed subject matter.

Sawada et al. disclose an image processing apparatus and, more particularly, an image processing apparatus for generating an address based on minimum and maximum values among signals indicating the three primary colors. Sawada et al. do not teach creating a second output based on a control parameter and a first output, using a second output to process the one of a

plurality of tiles, or the use of a concentration ratio as defined in the subject application. Accordingly, the deficiencies in the combination of Sussman et al. and Miyamoto are not overcome by further combination with Sawada et al. Moreover, Sawada et al., alone or in combination with Sussman et al. and Miyamoto, fail to teach all the limitations of the claimed invention. Therefore, it is submitted that claims 3 and 13 of the subject application are patentably distinguishable over the combination of Sussman et al. and Miyamoto further in view of Sawada et al. whereby the rejection under 35 U.S.C. § 103 has been overcome. Reconsideration is respectfully requested.

In the Official Action, claims 11 and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sussman et al. and Miyamoto, as applied to claims 10 and 20, and further in view of Hannah (US 5,859,710). The Examiner conceded that Sussman et al. do not disclose a system where the printer is coupled to the processor as described in claims 11 and 21. The Examiner asserted that Hannah teaches a digital copying system using a high-speed data bus, without the use of data buffer, where the printer is coupled to the processor.

However, as will be set forth in detail below, it is submitted that the methods and system defined by claims 11 and 21 are nonobvious over and patentably distinguishable from Sussman et al. and Miyamoto further in view of Hannah. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

Hannah teaches a copier for rendering an image of an object onto a physical medium. The copier includes a scanner, a printer and an external processor. Hannah does not teach creating a second output based on a control parameter and a first output, using a second output to process the one of a plurality of tiles, or the use of a concentration ratio as defined in the subject application.



As noted hereinabove with respect to independent claims 10 and 20, from which claims 11 and 21 depend, the combination of Sussman et al. with Miyamoto do not teach or suggest each limitation of the claimed subject matter and, accordingly, the combination of references does not enable the claimed subject matter. Moreover, Miyamoto is non-analogous art that may not form a basis for rejecting the claimed subject matter.

The deficiencies in the combination of Sussman et al. and Miyamoto are not overcome by further combination with Hannah. Moreover, Hannah, alone or in combination with Sussman et al. and Miyamoto, fails to teach all the limitations of the claimed invention. Accordingly, it is submitted that claims 11 and 21 of the subject application are patentably distinguishable over the combination of Sussman et al. and Miyamoto further in view of Hannah whereby the rejection under 35 U.S.C. § 103 has been overcome. Reconsideration is respectfully requested.

In the Official Action, claims 12 and 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sussman et al. and Miyamoto, as applied to claims 10 and 20, and further in view of Safai (US-PGPUB 2003/0048361). The Examiner conceded that Sussman et al. do not disclose a system where the image capture device is coupled to the processor as described in claims 12 and 22. The Examiner asserted that Safai teaches a digital camera where the digital camera includes an imaging unit connected to the digital camera.

However, as will be set forth in detail below, it is submitted that the methods and system defined by claims 12 and 22 are nonobvious over and patentably distinguishable from Sussman et al. and Miyamoto further in view of Safai. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

Safai teaches a digital camera and methods for using a digital camera. The camera includes a programmable processor for configuring and providing for the flexible operation of

the camera. Safai does not teach creating a second output based on a control parameter and a first output, using a second output to process the one of a plurality of tiles, or the use of a concentration ratio as defined in the subject application.

As noted hereinabove with respect to independent claims 10 and 20, from which claims 12 and 22 depend, the combination of Sussman et al. with Miyamoto does not teach or suggest each limitation of the claimed subject matter and, accordingly, the combination of references does not enable the claimed subject matter. Specifically, neither Sussman et al. nor Miyamoto teach or suggest creating a second output based on a control parameter and a first output, using a second output to process the one of a plurality of tiles, or the use of a concentration ratio as defined in the subject application. Moreover, Miyamoto is non-analogous art that may not form a basis for rejecting the claimed subject matter.

The deficiencies in the combination of Sussman et al. and Miyamoto are not overcome by further combination with Safai. Moreover, Safai, alone or in combination with Sussman et al. and Miyamoto, fail to teach all the limitations of the claimed invention. Accordingly, it is submitted that claims 12 and 22 of the subject application are patentably distinguishable over the combination of Sussman et al. and Miyamoto further in view of Safai whereby the rejection under 35 U.S.C. § 103 has been overcome. Reconsideration is respectfully requested.

In the Official Action, claim 23 was rejected under 35 U.S.C. §103(a) as being unpatentable over Paik et al. (US 6,163,621) in view of Miyamoto (US-PGPUB 2002/0175986). The Examiner asserted that Paik et al. discloses capturing an image of an object and applying controlled, equalization to an image generated by the image capture device. The Examiner conceded that Paik et al. do not explicitly mention that the controlled equalization uses a concentration ratio. The Examiner relies on Miyamoto for supplying this teaching.

However, as will be set forth in detail below, it is submitted that the method defined by claim 23 is nonobvious over and patentably distinguishable from Paik et al. in view of Miyamoto. Accordingly, this rejection is traversed and reconsideration is respectfully requested.

Paik et al. teach a method of processing an image comprising capturing an image of an object and applying controlled equalization to an image generated by the image capture device. Paik et al. do not teach using a concentration ratio CR as defined in the subject application.

References relied upon to support a rejection under 35 U.S.C. §103 must provide an enabling disclosure, i.e., they must place the claimed invention in the possession of the public. *In re Payne*, 203 U.S.P.Q. 245 (CCPA 1979). Furthermore, to establish prima facie obviousness of the claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974).

As noted hereinabove with respect to independent claims 1, 10, 20 and 24, Miyamoto does not teach the use of a concentration ratio as taught in the subject application. Moreover, the functionality of the concentration ratio (CR) of the present application is patentably distinct from the concentration ratio of liquid image forming solutions of Miyamoto. As acknowledged by the Examiner, Paik et al. does not teach or suggest the concentration ratio (CR) of the subject application. Accordingly, the combination of references does not enable the claimed subject matter. Moreover, Miyamoto is non-analogous art that may not form a basis for rejecting the claimed subject matter. Accordingly, it is submitted that the method claimed in the subject application is patentably distinguishable over the combination of Paik et al. and Miyamoto whereby the rejection under 35 U.S.C. § 103 has been overcome. Reconsideration is respectfully requested.

Finally, Applicants appreciate the Examiner's indication of allowable subject matter in claims 2, 7-9 and 17-19.

It is believed that the above represents a complete response to the Examiner's rejections under 35 U.S.C. §103 and places the present application in condition for allowance. Reconsideration and an early allowance are requested. Please charge any additional fees required in connection with the present communication, or credit any overpayment, to Deposit Account No. 04-1133.

Respectfully submitted,

/Brian A. Tent/

Brian A. Tent, Esq.  
Reg. No. 57,446  
DINSMORE & SHOHL LLP  
1900 Chemed Center  
255 E. Fifth Street  
Cincinnati, Ohio 45202  
(513) 977-8308